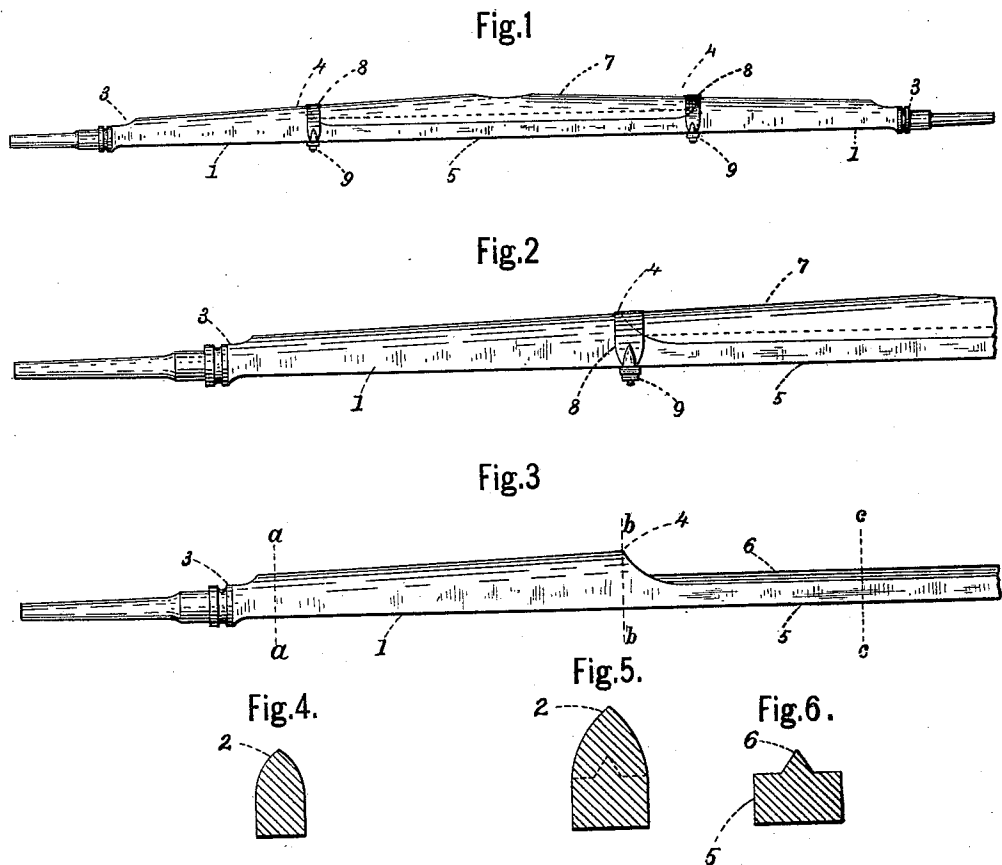


(No Model.)

W. H. CURTIS.
AXLE.

No. 463,621.

Patented Nov. 24, 1891.



Witnesses.

J. M. Caldwell.
R. A. Geary

William H. Curtis, Inventor.
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UNITED STATES PATENT OFFICE.

WILLIAM H. CURTIS, OF OLEAN, NEW YORK.

AXLE.

SPECIFICATION forming part of Letters Patent No. 463,621, dated November 24, 1891.

Application filed June 20, 1891. Serial No. 396,891. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. CURTIS, a citizen of the United States, residing in Olean, in the county of Cattaraugus and State of New York, have invented certain new and useful Improvements in Axles, of which the following is a specification.

My invention consists in certain improvements in axles for wheeled vehicles or carriages, whereby greater strength is secured without increasing the weight, all of which will be fully and clearly hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of the axle complete. Fig. 2 is an enlarged side elevation of one-half of the axle, it being represented on a larger scale to show the several parts more clearly. Fig. 3 is a similar view showing the metal portion only, the central wooden strengthening portion being omitted. Fig. 4 is a cross-section on or about line *a a*, Fig. 3, all beyond the section being omitted. Fig. 5 is a cross-section on or about line *b b*, Fig. 3. Fig. 6 represents a cross-section on or about line *c c*, Fig. 3, all beyond this section being also omitted.

The object of my invention is to so construct an axle as to increase its strength in a direction where the greatest strain is brought upon it without adding to its weight—that is, at a point on each side near the axles. This I do by making the metallic portions 1 of the axle in cross-section in the form of a pointed arch 2. (See Figs. 4 and 5.) This form of the axle extends from near the opposite ends 3 in toward the center of the axle each way to or about the points 4, more or less. (See Fig. 1.) Between the points 4 is a reduced portion 5, having a reversed-V-shaped

rib 6, which extends longitudinally between the two points 4, as shown. This portion of the axle is preferably made of steel; but any other suitable material may be used. Over the reduced portion is fitted a wooden brace 7, which is provided with a groove corresponding with the rib 6, so as to fit the whole surface closely. The wooden strengthening-brace is cemented in any well-known way to the metallic portion, and is also securely held in place by the usual clips 8 and their screw-nuts 9. This form of axle, it will be seen, gives it great strength with comparative lightness.

I claim as my invention—

1. An axle for carriages, consisting of a metallic portion extending inward from each of the axle-bearings, each having the form of a pointed arch in cross-section, and a central portion between the two of reduced thickness, the whole formed of metal in one piece, in combination with a wooden brace secured to the reduced portion, substantially as described.

2. An axle for carriages, consisting of a metallic portion extending inward from each of the axle-bearings and each having the form of a pointed arch in cross-section, and a central portion forming part of the same, reduced in thickness between the two arch-shaped portions and provided with a longitudinal rib, in combination with a central wooden brace secured to the reduced portion and clips for holding them at the ends, substantially as described.

WILLIAM H. CURTIS.

Witnesses:

JAMES SANGSTER,
JOHN HAYER.